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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/760,926	01/16/2001	Takao Abe	09792909-4756	4866

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 09/11/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/760,926

Applicant(s)

ABE, TAKAO

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 3, fourth paragraph, Figure "6A" is referenced, however, Figure 6A does not exist in the application. Additionally, in the "Brief Description of the Drawings" section, sub-labels "A," "B," etc. are not referenced for Figures 2, 3, 4, 5, 7, and 8. Language such as "Figs. 2A-C are cross-sectional views..." would be sufficient to obviate this objection.

Appropriate correction is required.

Claim Objections

2. Claims 9, 11, 13, and 19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 9, 11, 13, and 19 are all identical to the claims they directly depend from. Therefore, these claims fail to further limit the parent claims.

3. Claims 2, 3, 5, 7, 9, 11, 13, 17 and 19 are objected to because of the following informalities: In each of claims 7, 9, 11, 13, 17 and 19, the term "winded" in the last clause should be "wound." Additionally, in claim 11, it appears that the phrase "coiled electrode" has

been omitted from the end of the claim; in claims 2 and 3, line 2, "value" should be "valve"; and in claim 5, line 2, "welded" should be "is welded." Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 3 and 10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a projecting portion connected to a lead through a hole in the disk, does not reasonably provide enablement for a projecting portion connected to a lead through a "small-thickness portion" of the disk. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The claimed disk is best shown in Figs. 5A-D of the application as reference character 11. There does not appear to be any indication in these figures or in the rest of the specification that the projecting portion (6a) is connected to a lead through a "small thickness portion" of the disk 11. The projecting portion is, however, clearly connected through the hole (11c) in the disk. Correction and/or clarification is required.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- / 7. Claims 15 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15 and 18 recite "a [the] safety valve according to claim 13." However, the preamble of claim 13 is directed to a nonaqueous secondary battery. Accordingly, the inconsistent preambles result in a lack of clarity in claims 15 and 17-19.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

9. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102^(a)~~(e)~~⁽ⁿ⁾ as being anticipated by JP 2000-21380. Regarding claim 1, the reference is directed to nonaqueous lithium secondary batteries (see paragraph [0001] of the machine translation). As shown in Figure 11, a safety valve (RP) is arranged on one end side of a cylindrical outer packaging can (1) holding an electrode element therein. The safety valve comprises a projecting portion (532) that projects toward the electrode

element and is connected to a lead of the element (32) at the center of the safety valve. As shown in Figures 8 and 10, the safety valve comprises a plurality of linear thin portions (R5) that are formed almost along circumferences of concentric circles surrounding the projection. Additional thin portions (R4) extend in the radial direction and connect adjacent ends of the circumferential thin portions. Regarding claim 2, the lengths of the circumferential thin portions are almost equal to each other. Regarding claim 5, the valve is welded on a sub-disk (9) on a free end of the positive electrode lead (32) (see paragraph [0029]).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 6-9, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-21380.

The reference is applied to claims 1, 2, and 5 for the reasons stated above. However, the reference does not expressly teach that the electrode element is a spirally-wound laminate (claims 7, 9, 11, and 13) or that the battery comprises electrode materials which dope and undope lithium (e.g., that it is a lithium-ion battery) (claims 6 and 8).

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use such a spiral laminate as the electrode element of the Japanese reference. As noted above, the reference teaches a cylindrical battery body in Figure 11. The artisan would therefore be motivated to use a spiral laminate because this structure is commonly used in cylindrical lithium batteries and is known to result in a high energy density. Furthermore, the artisan would be motivated to use electrode materials that dope and undope lithium so as to result in a lithium-ion battery, because these materials are known to have higher cycle life and increased safety compared with electrode materials that do not intercalate lithium (e.g., lithium metal). Accordingly, this limitation is also not considered to distinguish over the reference.

12. Claims 3, 4, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-21380 as applied to claims 1, 2, 5-9, 11, and 13 above, and further in view of JP 10-284035.

Regarding claims 3 and 4, JP 2000-21380 further teaches the presence of a disk (11) comprising a central hole between the safety valve (RP) and the sub-disk (9). However, the reference does not expressly teach that the disk has a linear thin portion.

JP 10-284035 is directed to an explosion-proof mechanism for a sealed battery. In Figure 1, it teaches an upper safety valve (17) having a thin portion welded to a lower disk (18) also having a thin portion (29).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of JP '035 to use a thin portion in the disk of JP '380. In paragraph [0010], JP '035 teaches that "reliable current interception function" can be obtained using this configuration. Accordingly, the artisan would be motivated to use a rupturable thin portion in the disk of JP '380.

13. Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taki et al (U.S. Patent 5,418,082) in view of JP 10-284035.

Regarding claims 17 and 19, Taki et al. is directed to nonaqueous lithium secondary batteries having spirally-wound electrode laminates (see col. 1, lines 10 and 46). Regarding claim 14, as shown in Figure 6, a safety valve (5) is arranged on one end side of the cylindrical outer packaging can (2) holding the electrode element therein. The safety valve comprises a projecting portion (9) that projects toward the electrode element and is connected to a lead (7) of the element at the center of the safety valve. A disk (23) having a central hole (21) is positioned between the safety valve and the electrode element, and the projecting portion is connected to the lead of the electrode element through the central hole.

The reference does not expressly teach that the disk has a linear thin portion formed in a circular shape surrounding the hole (claims 14 and 15). The reference further does not teach that

the battery comprises electrode materials which dope and undope lithium (e.g., that it is a lithium-ion battery) (claims 16 and 18).

As noted above, JP 10-284035 is directed to an explosion-proof mechanism for a sealed battery. In Figure 1, it teaches an upper safety valve (17) welded to a lower disk (18) having a circular thin portion (29).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of JP '035 to use a thin portion in the disk of Taki et al. In paragraph [0010], JP '035 teaches that "reliable current interception function" can be obtained using this configuration. Accordingly, the artisan would be motivated to use a rupturable thin portion in the disk of Taki et al.

Furthermore, the artisan would be motivated to use electrode materials that dope and undope lithium so as to result in a lithium-ion battery, because these materials are known to have higher cycle life and increased safety compared with electrode materials that do not intercalate lithium (e.g., lithium metal). It is noted that the reference teaches a "carbon lithium battery" in column 1, line 11, which is indicative of a carbonaceous lithium intercalation negative electrode. Accordingly, the recitation of intercalation electrodes in claims 16 and 18 is also not considered to distinguish over the references.


Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051.

The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700

JSC

September 6, 2002